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October 14, 1950

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



A Bed of Stone

See Page 242

A SCIENCE SERVICE PUBLICATION

\$5.50 A YEAR

VOL. 58 NO. 36 PAGES 241-254

MILITARY DEFENSE

Student Deferment Fight

Hershey says that local draft boards will have to handle student deferment although top scientists hope that a deferment policy board of experts will be set up.

► **SELECTIVE** Service and scientists are building up for a fight over whether local draft boards shall control deferment of students and trained scientists, technicians and engineers. Recently, in reporting to a meeting in Washington of the American Council on Education on the recommendations of six advisory groups as to how to handle such deferments, Selective Service Director Lewis B. Hershey emphasized that the local boards must do the selecting and the deferring.

Most scientists, including many of the members of the six advisory committees representing most fields of learning, hope that President Truman will take such deferments out of the hands of local boards and perhaps entirely out of Selective Service discretion.

Representatives of four top scientific societies (the National Research Council, the American Chemical Society, the American Institute of Physics and the Engineers Joint Council) are preparing within two weeks to recommend to the National Security Resources Board that a separate body of experts in the fields to be deferred be set up to determine deferment policy. If this were done, Selective Service boards would be required to follow their recommendations.

This advice would make one of the main features of the report of General Hershey's advisers on how to handle college students' and scientists' deferment within the present

Selective Service law pretty much a dead letter. Now the four scientific societies, sometimes speaking through the same men, are preparing to advise NSRB to take this power away from Selective Service.

General agreement with three main points in the recommendations of the six special Selective Service committees was reached at a meeting of more than 550 distinguished educators and scientists at the American Council on Education sessions. They agreed that: 1. A nationwide aptitude test should be given to all high school seniors and that only those who passed this test should be deferred to go to college. 2. Certain percentages of sophomores, junior, senior and graduate classes in universities and colleges should also be deferred, and 3. No attempt should be made to pick out "essential" areas of study and defer students in those only, because no one knows now what will be essential to the national interest in five or ten years.

Scientists and educators are worried that the general public will feel they are seeking a sort of "draft-dodger status for college students and scientists. They may indicate, through a resolution at the meeting, that they feel that any man who is deferred to complete his studies has an obligation to use his training in the national interest. If he doesn't go into uniform, they feel, he certainly should work on something the government considers essential.

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ARCHAEOLOGY

Clue to Ancient Eskimos

See Front Cover

► **TINY** flakes of stone about the size of a paper clip which have lain frozen in the soil of the Canadian Arctic for thousands of years are the latest clues to the lives of the most remote ancestors of Eskimos.

These flakes were chipped off stone chunks and then delicately worked to an edge by the Dorset people whom archaeologists call the "ghosts of the Arctic," because so little is known about them. They were probably the first Eskimos to reach the New World, no one knows just how many centuries before the coming of Columbus. The flakes were probably used as tiny knives or scrapers.

They were found by Dr. Henry B. Collins, Jr., of the Smithsonian Institution and William E. Taylor, of the National Museum

of Canada, digging in the icy soil of Cornwallis Island, far up in the polar regions.

The flakes, known to scientists as "Lameller" flakes, link the earliest inhabitants of far northern Canada to men who lived in Asia in Middle Stone Age or New Stone Age days.

The mystery of how the antiquity of America's Stone Age man compares with that of his Old World relatives seems about to be solved. Dr. Collins found associated with the ancient stone flakes, some particles of wood which he has brought back and will submit for study of the carbon 14 content.

Since it is now known that organic matter gives off radiation from radioactive carbon 14 which disintegrates at a regular rate, the age of wood, bones, horns, skin and other once living matter can therefore

be determined by the proportion of carbon 14 remaining in the specimen.

"This method of dating," Dr. Collins commented, "is push-button archaeology. It is as simple as having a roll of film developed."

The new discoveries supplement those made by Dr. Collins in the same region last year in a joint expedition for the National Museum of Canada and the Smithsonian. Then it was found that the Thule Eskimos who preceded the modern Eskimos once lived on Cornwallis Island, built houses of wood and stone supported by whale bones, and hunted whales. Life there is too rugged for the Eskimos nowadays; there are no whales, neither is there driftwood.

The photo on this week's cover of *SCIENCE NEWS LETTER* shows remains of Thule living quarters. Notice the stone bed in right foreground. The "veiled ladies" are whale bone roof supports.

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ICHTHYOLOGY

"Red Tides" Do Suffocate, Do Not Poison, Fish

► **"RED TIDES,"** mysterious waves of evil-smelling, blood-red death which periodically sweep U. S. coastal areas clean of all marine life, apparently kill fish by suffocation rather than poisoning, two University of Texas biologists report.

"Red tides" are known to be caused by sudden multiplication of red-colored, one-celled organisms called protozoa, which are near the bottom of the evolutionary scale. But why they multiply so suddenly, and how the organisms kill fish, are still puzzles to scientists.

Drs. Cecil H. Connell and Joy Barnes Cross have found that a Galveston "red tide" in 1949 occurred in a bayou that was slightly polluted by sewage. The multiplying organisms caused "extraordinarily wide and rapid" changes in the amount of oxygen in the water.

Fish did not die in the "red water," they say, but rather died after the redness had settled, leaving the water turbid and milky and nearly devoid of dissolved oxygen.

The Galveston "red tide" marked an eastward move by a villain known as Gonyaulax, belonging to the order dinoflagellates. Previously this tiny marine creature had caused wide-spread losses of fish along the Pacific Coast.

One type of Gonyaulax is known to be the cause also of disastrous human poisoning, carried by polluted mussels. This type manufactures a poison 10 times as deadly to mice as strychnine. But the poison has little effect on fish, and does not explain the mass destruction of the "red tides," scientists say.

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More than half the 8,500 homicide cases annually in the United States are killed by gunfire.

ARCHAEOLOGY-NUCLEAR PHYSICS

New Age for American Man

A radiocarbon calendar for the past 20,000 years devised by Libby and Arnold shows by the dating of woven rope sandals the oldest evidence for man in America.

► WOVEN rope sandals found in a lava-covered Oregon cave become the oldest articles associated with man in the Americas as the result of the radiocarbon atomic calendar presented to National Academy of Sciences recently by Dr. Willard F. Libby and Dr. James R. Arnold of the University of Chicago's Institute of Nuclear Studies.

These sandals are approximately 9,000 years old. The ancient Americans who wove them and wore them become the oldest proved inhabitants of this continent, dating back to 7000 B.C. This probably antedates the oldest agricultural village in Iraq, which the radiocarbon dating of shells found there, also reported, show to be at least of the period 5000 B.C.

The greatest upset in American antiquity resulting from the radiocarbon dating is in the age of charcoal from a fire-pit presumably associated with Folsom man, to whom ages of from 10,000 to 20,000 years had been assigned. Dr. Libby's very sensitive Geiger-type counter showed the "surprisingly young" average age of about 4,300 years.

This makes the Folsom inhabitants actually more recent than people who built fires in Frontenac and Lamoka regions of New York State about 5,000 years ago, by the radiocarbon dating. The oldest Indian mounds in Kentucky have about this same age, as shown by analysis of shells and deer antlers. These are the oldest evidence of human beings in eastern America.

The method of radiocarbon dating is based upon the determination of the amount of radiocarbon or carbon 14 in the organic material being tested. This radioactive carbon is created in the upper atmosphere when cosmic rays strike the hearts or nuclei of nitrogen atoms. Some of this carbon reaches earth and is absorbed through food and water by plants and animals during their lifetime.

The radioactivity is lost at a constant rate, half of it disappearing in 5,568 years with a possible error of 30 years in this half-life of C 14. The amount of radiocarbon in the organic remains thus provides an index to the date that they were formed. The method is accurate to within approximately a hundred years. All but a minute amount of radiocarbon is gone after 25,000 years and the Libby method can not date objects beyond that span.

Some 300 organic objects were selected about a year and a half ago by a committee of experts as most significant for dating and Dr. Libby reports now on 159 of these.

In each case a minimum of an ounce of material is necessary. Refined methods of chemical separation are needed to obtain the radiocarbon which is counted over a period of 48 hours.

The Ice Age of the U. S. Middle West was more recent than generally estimated by geologists. Instead of being 20,000 years ago, the radiocarbon evidence shows that it was 12,000 years ago. The glacial epoch was apparently contemporaneous in Europe, for samples from Ireland, England and Germany agree closely with the Wisconsin dating of the final phase of the ice cap.

Man's first proven existence in North America was 10,000 years ago, shortly after the glaciers receded. These first known humans were in Oregon and Nevada, and there is no evidence of man on the east coast until 5,000 years later.

The giant sloth lived in Gypsum Cave, Las Vegas, Nev., about 10,500 years ago, as analysis of its dung shows. Presumably man there was contemporaneous.

A fishweir unearthed three years ago in Boylston Street, Boston, is believed to be about 5,000 years old, contemporaneous with the record-age discoveries in New York State and Kentucky, judging by analyses of the peat underlying and the wood overlying it.

Wood from Egyptian tombs, a funeral ship and a mummy case gave age figures in general agreement with the dates from the historical records 2,000 to 4,000 years ago. Other tests show that in 4,000 B.C. Egypt had a simple village and agricultural culture. By 3,000 B.C. it had its first dynasty and only 300 years later the first pyramid building began.

Mexico was inhabited at least 7,000 years ago by people who produced crude carvings. The famous Pyramid of the Sun near Mexico City is dated by Dr. Libby at 300 B.C. The temples of Monte Alban at Oaxaca in southern Mexico are dated to 600 B.C.

Burned bones of giant sloths, horses and the camel-like guanaco which were associated with human bones and artifacts in Chile at the tip of South America were dated as about 8,500 years old. These are the most ancient of the human samples from South America and contemporaneous with the Gypsum cave culture in North America.

Crater Lake in Oregon is dated as 6,500 years ago by an analysis of remains of trees killed by flowing lava from the volcanic explosion that created it.



SMOG SAMPLER—The improved electrostatic sampler is used to trap all types of dusts, fumes and smoke in atmosphere. The instrument will be an important tool for investigation of air pollution causes by health officials and industrial hygienists. (See Next Page.)

Charcoal from the famous Lascaux cave in the Dordogne, France, which has remarkable paintings made by early man in Europe is dated as about 15,000 years old.

All of Dr. Libby's dates are given in

detail with the findings of individual samples and their averages, each with a probable error that runs several hundred years in most cases.

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CHEMISTRY

Cheaper Sulfuric Acid

► AN EASIER, cheaper way of making sulfuric acid, extensively used in vast quantities for many industrial processes, is promised by a new method revealed in New York by the Chemical Construction Corporation.

Some 10,000,000 tons of the acid are used each year in the United States. The fertilizer industry is the largest consumer but hundreds of other manufacturing processes are dependent upon it. Sulfuric acid is a very active chemical compound composed of sulfur, hydrogen and oxygen.

The new way to make this acid is said by the developers to eliminate seven major items of equipment used in present processes. The new design is much simpler than the conventional contact process and represents a saving of about 25% of the present capital cost of an erected, medium-sized acid plant in this country.

In the manufacture of sulfuric acid, sulfur dioxide, obtained by the combustion of sulfur or roasting a sulfide, is converted into sulfur trioxide. A catalyst is used to aid the chemical reaction. The catalytic oxidation in the new process is carried out in four successive stages. Temperature control is effected by admitting cold air between these stages.

Sulfur trioxide absorbed in and chemically united with water becomes sulfuric acid. At one stage in the new process the sulfur compound is in the form of a fine mist. This is used to enrich weak acid in a venturi tube. Turbulent currents in the mist mix the materials and hurry their combination. Large amounts of heat given

off by the combining chemicals evaporate the excess water. Acid up to 95% strength can be achieved economically by the new method.

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CHEMISTRY

Collector Determines Air Pollution

► DANGEROUS substances in the air, such as those sometimes found near certain manufacturing plants, can be easily collected for analysis with a new device developed in Pittsburgh by Mine Safety Appliances Company. It is usable also in mines and highway tunnels where air pollution often exists.

It is a timely development now that the public is awakened to the dangers that may come from air pollution from modern manufacturing methods. The smog tragedy at Donora, Pa., which took 21 lives, greatly hurried this awakening. Among the first users of this new sampling equipment were the men of the U. S. Public Health Service who reported their investigations of the Donora air conditions a year ago.

This device utilizes what scientists know as electrostatic precipitation. Air passing through a sampling tube is bombarded by electrons from an ionizing electrode. All particles in the air are given a negative electric charge by the electrons. Then they are attracted to a positively grounded aluminum collecting tube. In the laboratory the particles are removed and analyzed.

The sampling head of this equipment, weighing only four pounds, is self-contained and resembles a small hair-dryer. In the head is a blower that provides a constant flow of three cubic feet of air per minute. The head also contains the ionizing electrode and the aluminum collecting tube which fits around the electrode. Power is by cable from an electric outlet or portable generator. The current is rectified through a voltage doubling circuit using two electronic tubes.

Science News Letter, October 14, 1950

SCIENCE NEWS LETTER

VOL. 58 OCTOBER 14, 1950 No. 16

43,800 copies of this issue printed

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N. W. Washington 6, D. C., NOrth 2255. Edited by WATSON DAVIS.

Subscription rates: 1 yr., \$5.50; 2 yrs., \$10.00; 3 yrs., \$14.50; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address: Three weeks notice is required. When ordering a change please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

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Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C. under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 3440, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925; 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to periodical literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., Pennsylvania 6-5566 and 360 N. Michigan Ave., Chicago. STAtE 4439.

SCIENCE SERVICE

The Institution for the Popularization of Science organized 1921 as a non-profit corporation.

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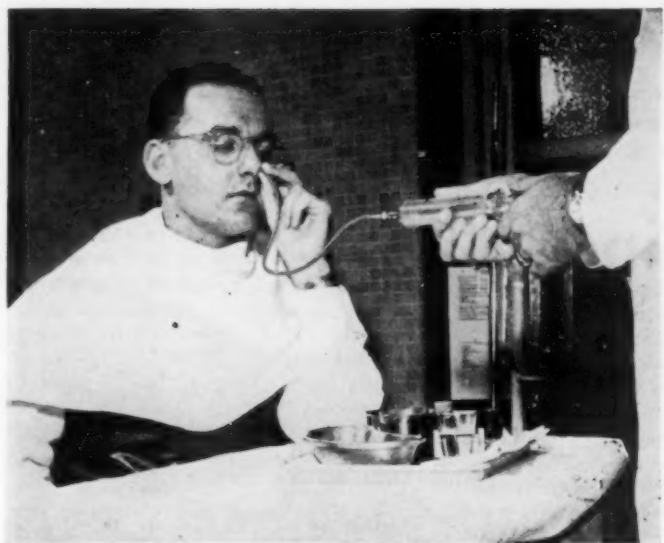
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NUCLEAR PHYSICS

Where is the first atomic energy project to be self-financed? p. 254.

Photographs: Cover, Dr. Henry B. Collins; p. 247, Dr. A. von Hippel; p. 250, Atomic Energy Commission; p. 251, American Red Cross.



WET SMEAR CANCER DETECTION TEST—Gastric fluid is extracted for later analysis by the smear technique. On the right, technicians fix and stain the smear slides while Dr. Papanicolaou who devised the technique watches.

MEDICINE

Cancer Prevention by Test

Dr. George N. Papanicolaou received a 1950 Lasker award for his diagnostic test for cancer. Cancers of internal organs may be diagnosed by this test.

► MORE practical cancer prevention is foreseen as a result of the famous Papanicolaou cancer diagnostic test for which its discoverer, Dr. George N. Papanicolaou of Cornell University Medical College, received one of the 1950 \$1000 Lasker Awards of the American Public Health Association.

Dr. George Wells Beadle, professor of biology and chairman of the biology division, California Institute of Technology, and Dr. Eugene Lindsay Bishop, director of health and safety for the Tennessee Valley Authority, also each received one of the awards. The group award was conferred on the International Health Division of the Rockefeller Foundation.

The Papanicolaou cancer diagnostic test depends on the fact that cancers of internal organs and body structures such as the uterus, urinary tract, stomach and lungs shed superficial cells which can be obtained for examination almost as easily as if the cancers were located on the outside of the body.

Valuable as the test is now for diagnostic purposes, it is considered to have even greater potential value for the future.

"It seems not impossible that repeated observations using this cytological (cell study) method will reveal the earliest changes of cancer," is the opinion embodied in the Award citation.

When the changes in cells revealed by

the test can be regularly shown, scientists think they may have an index to the effectiveness of methods designed to restore pre-cancer cells to normal.

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AERONAUTICS

International Air Trip Delays To Be Eliminated

► MANY of the recommendations of the International Civil Aviation Organization designed to reduce or eliminate obstacles and delays in international air travel are proving effective in the United States, the Civil Aeronautics Administration revealed in Washington.

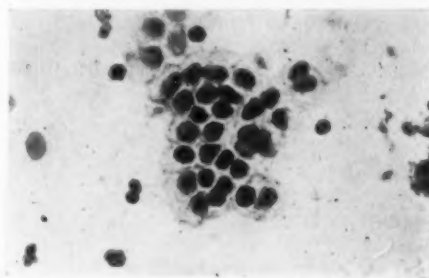
The international body, which includes representatives of more than 50 nations, has been for several years studying possible ways for cutting out red tape and other obstacles which delay the passage of travelers, mail and cargo on international routes.

To implement the work of the international group and make aviation-promotion recommendations of its own, an American committee was appointed by CAA in 1945. It consists of representatives of 10 government agencies and two air transport associations. It is known as the Subcommittee on Facilitation of International Civil Aviation, and is dubbed FAL for short.

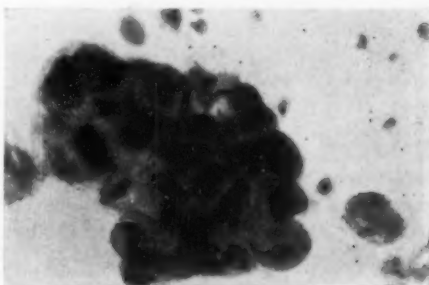
A report of this committee reveals that solid accomplishments in reducing or eliminating obstacles and delays in international air travel were made during the past fiscal year. The committee report lists 29 accomplishments in facilitating air travel and movements of aircraft and goods across United States borders.

The greatest single accomplishment, according to the report, has been the approval and almost complete implementation of recommendations of the international group relative to national boundary-crossing obstacles.

Examples of smoothing the way for travelers in international air travel include



Non-Cancerous Cells



Cancerous Cells

the elimination of transit visas for persons who are in continuous transit across the United States from one country to another. Also important is elimination of the necessity of obtaining a CAA permit for con-

duct of private flights or flights not in furtherance of a business involving the carriage of mail, persons or cargo into the United States.

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PUBLIC HEALTH

Polio Study in Paulding

► A TEAM of over 25 polio fighters and public health experts gathered from all parts of the nation, moved into Paulding, Ohio, recently to begin what is considered a unique study of a rural poliomyelitis epidemic.

Thus, the scientists hope to learn more about how polio is spread and why it behaves as it does.

Paulding County, the field of their investigation, has been threatened with becoming a second Wytheville, Va., with 32 reported cases and four deaths from polio since the first of August. With a population of about 15,000, the county has an epidemic rate of more than 200 cases per 100,000 population. Authorities consider 40 cases per 100,000 to be a major epidemic.

"This epidemic is in some ways similar to Wytheville's but apparently not as severe," said Dr. C. R. Freeble, chief of the Ohio Health Department's communicable disease division, on his arrival in Paulding.

The special research team will work under Dr. Freeble's direction. It was gathered at the request of Dr. John D. Porterfield, director of the Ohio Department of Health. About 15 of the experts are being furnished by the Communicable Disease Center, U. S. Public Health Service. Dr. R. A. Vonderlehr, medical director in charge of the center, said that scientists have been sent from Atlanta, Montgomery, Ala., Charleston, W. Va., and other points. The others of the team are state health department personnel.

Dr. Ralph S. Paffenbarger, Communicable Disease Center epidemiologist, is

field director of the epidemic team. Working under him are physicians, statisticians, nurses, engineers, entomologists, veterinarians and laboratory authorities on virus disease.

"From our past experience we know that there are no steps we can take now to arrest the progress of the epidemic," Dr. Paffenbarger said. "We do, however, want to make a thorough study in the hope that some clue will be uncovered which will make it possible in future to stop such epidemics. At the same time we also want to provide such immediate aid as the community needs."

Here is how the research team will work: Medical epidemiologists will investigate all the circumstances surrounding the occurrence of each paralytic case and conduct other research.

Statisticians will make door-to-door surveys to measure the incidence of paralytic disease against that of other diseases which might be so-called "hidden," or unrecognized, polio.

Laboratory physicians will collect virus samples for study.

Engineers will conduct an environmental survey, studying all the factors in the environment which might bear on the polio incidence. These might include food, water, milk and sewage.

Entomologists will check the insect population and collect specimens.

A veterinarian will study the diseases of animals which might, in some way, be related to the human poliomyelitis.

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PSYCHIATRY

Factors in Breakdown

► ENVIRONMENT is in most cases more important than heredity in determining breakdown under strain, it appears from studies with animals at the behavior division of the Roscoe B. Jackson Memorial Laboratory in Bar Harbor, Me.

In an individual case, however, the reverse may be true. Minor differences in heredity may make very great differences when animals are placed in a stress situation serious enough to produce breakdowns in some animals. Under ordinary conditions the hereditary difference may be unimportant, but in a stress situation it makes

the difference between breakdown and no breakdown for the individual.

The time when any social relationship begins is very important from the standpoint of preventing breakdowns and fostering good mental health, the scientists suspect from their studies.

The reason is that learning which takes place at that time may determine the nature of future relationships. For dogs the most important critical period takes place from about three to six weeks of age. Puppies which have their tails cut off at one week of age, for example, show no difference in

behavior from normal littermates. But a grown dog that had to be assisted in the delivery of her puppies, during which considerable unavoidable pain was caused, cannot be picked up by the person who assisted at delivery without yelping as if in pain.

While social factors, or environment, in many cases produce the stress that leads to breakdown, the nature of social adjustment patterns is itself in part determined by heredity and thus in part influences the likelihood of stress.

A factor which causes stress in one kind of animal may not do so in another, the scientists found. Dogs are badly upset by isolation, but mice are much less troubled by it. Within a single species, however, some dogs adjust themselves well to confinement whereas others cannot sit still even for short periods.

Details of the studies are reported by Dr. J. Paul Scott, director of the Jackson Laboratory's behavior division, to the Association for Nervous and Mental Disease.

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VETERINARY MEDICINE

Radioactive Eggs Trace Growth of Chickens

► RADIOACTIVE tracers from Oak Ridge are enabling veterinary scientists to follow, step by step, the growth of a chicken from an egg.

Radioisotopes of phosphorus, calcium, potassium, sodium, iodine, sulfur, iron, manganese, cobalt, zinc and carbon are now being used in poultry studies, Drs. C. L. Comar of Oak Ridge and O. E. Goff of Knoxville, Tenn., told the American Veterinary Medical Association in Miami Beach, Fla.

"Hot" phosphorus, for example, is tracing the formation of egg yolk and the development of chicken embryos, and helping scientists tag invisible viruses in infected eggs. Calcium and phosphorus isotopes trace the way a chicken utilizes those elements from its feed. Radioactive iodine is aiding studies of the thyroid gland in poultry.

Meanwhile, a committee of the AVMA has tackled the monumental task of putting all the diseases of animals into a single nomenclature. No one knows exactly how many animal ailments there are, but the AVMA's aim is to standardize disease classification according to origin and thus eliminate the use of several names for the same disease.

A new blood serum test for spotting distemper in foxes was reported by Drs. M. Savan and C. A. Brandy of the University of Wisconsin. They said the disease is now causing serious losses on American fur farms. In the new test, blood from a fox is mixed with a special virus preparation. If the animal is infected, a characteristic reaction takes place.

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GENERAL SCIENCE

Search for Science Talent

The national search for students possessing scientific ability is entering its tenth year. The present Korean situation points up the need for such talent.

► A NATIONWIDE search for boys and girls with research ability in science started Sept. 28.

High school seniors in 27,000 public, private and parochial schools in continental USA were invited to enter the Tenth Annual Science Talent Search and compete for \$11,000 in Westinghouse Science Scholarships to continue their education in science. In announcing the Science Talent Search for the tenth consecutive time, Watson Davis, director of Science Service, which conducts the search through Science Clubs of America, called the attention of school administrators to the need for more people trained in science.

"The present Korean situation," Mr. Davis said, "points up the urgency of keeping our scientific resources constantly replenished so our country will be in a state of readiness to move forward in war or peace. The greatest resource is the talent of our boys and girls. It must be recognized and cultivated wherever it can be found."

Principals and science teachers in secondary schools throughout the country are now receiving instructions on "How To Search for Science Talent." They will learn how to recognize science talent among their students and encourage those boys and girls to enter the Tenth Annual Science Talent Search.

They will send for and after Nov. 15 receive about 14,000 sets of entry materials so their qualifying seniors can enter the competition for \$11,000 in scholarships. Thousands of seniors will comply with all requirements for entry right in their own schools.

From the 14,000 entries it is estimated about 3,500 will complete all entry requirements. Of these, 40 will be named as national winners and will receive 5-day, all-expenses-paid trips to Washington, D. C., to attend the Annual Science Talent Institute.

Another 260 will be named for honorable mention. All 300 will be recommended to colleges, universities and technical schools of their own choice. As in the past, it is expected many will receive offers of financial assistance for college educations from other sources on the basis of this honor.

To comply with entry rules each contestant must take a three-hour science aptitude examination in his own school, submit personal and scholastic records and write a report of about 1,000 words on "My Scientific Project." The examination may be taken anytime from Dec. 11 through Dec. 16.

All entries must be in the offices of Science Clubs of America by midnight, Wednesday, Dec. 27, when the competition closes.

Winners and honorable mentions will be announced late in January, 1951, and the 40 winners will come to Washington, D. C., in March, 1951. After five days of meeting the nation's outstanding scientists, of learning about the latest developments in science and of visiting places of historic and scientific interest, the winners will receive scholarships ranging in size from \$100 to \$2,800.

Through the nine years of its existence the Annual Science Talent Search has located 360 winners and 2,340 honorable mentions. These young people are now making their mark in scientific circles. Many of them already have from one to four degrees in science and are active as chemists, physicists, doctors, mathematicians, engineers, biologists, astronomers and in many other fields of science. Some have made important contributions to their fields of study and others are well along in their preparation to do so.

The objectives of the Science Talent Search are:

1. To discover and foster the education of boys and girls whose scientific skill, talent and ability indicate potential creative originality and warrant scholarships for their development.

2. To focus the attention of large numbers of scientifically gifted youths on the need for perfecting scientific and research skill and knowledge so that they can increase their capacities for contributing to the rehabilitation of a war-dislocated world and to help the United States, with the aid of science, to lead the world to permanent peace.

3. To help make the American public aware of the varied and vital role science plays in world affairs and in raising the standard of living.

High school seniors in some states will have a double chance to win scholarships through state Science Talent Searches run concurrently with the national competition and by special arrangement with Science Clubs of America.

In 1951 the following states will hold these competitions: Connecticut, District of Columbia, Georgia, Illinois, Indiana, Iowa, Kansas, Louisiana, Maine, Massachusetts, Minnesota, Montana, New Hampshire, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Vermont, Virginia, West Virginia and Wisconsin.

The Science Talent Search is conducted annually by Science Clubs of America, administered by Science Service. It is made financially possible by the Westinghouse Educational Foundation of the Westinghouse Electric Corporation.

For complete details of the Science Talent Search write to Science Clubs of America, 1719 N St., N. W., Washington 6, D. C.

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ICHTHYOLOGY

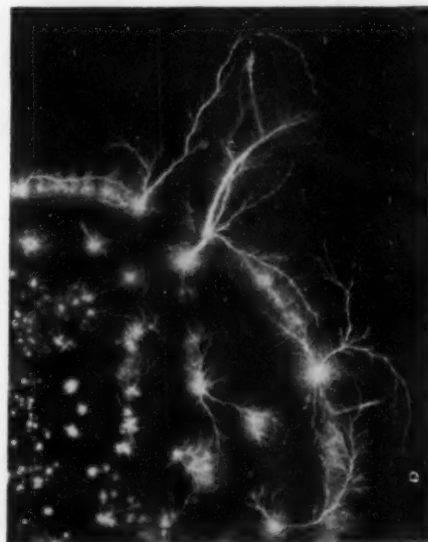
Lime in Lake Gives More, Better Trout and Bass

► FROM stunted bullheads and undersized panfish to shining lake trout and fresh water bass is the transformation wrought by two Wisconsin scientists who sowed ordinary lime in small, swamp-surrounded bog lakes.

Drs. Arthur D. Hasler and Oscar M. Brynildson of the University of Wisconsin found they could change the chemical character of lake water—and enable more and better fish to live in it—by treating certain lakes in the same way farmers fertilize their soil, using lime to combat acidity.

The zoologists found lime reduced the brown, acid discoloration of water in swamp-fed lakes. Sunlight could then penetrate and more plants would grow on the bottom, thereby increasing the oxygen content of the water. Presto, trout and bass could live in the lakes, where before there had not been enough air for these fighting fish.

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ELECTRONS MULTIPLY — The photograph portrays the breakdown of nitrogen gas under a high transient electric voltage. From pictures of this type, scientists are learning more about the detailed mechanisms by which electrons and ions destroy insulating materials.

MEDICINE

Patient Survives Removal Of Both Adrenal Glands

► A CASE in which both vital, cortisone-producing adrenal glands have been removed from a patient with high blood pressure and diabetes is reported by Drs. D. M. Green of Chicago, J. N. Nelson and G. A. Dodds of Seattle and R. E. Smalley of Billings, Mont., in the *JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION* (Oct. 7).

The patient is a young married woman who developed diabetes at the age of six and high blood pressure at the age of 20, eight years before the operation. The high blood pressure condition was severe and getting worse. For two years before the operation she had attacks of headache, intense nervousness, flushing of the face and blindness. Her ankles were swollen, she had trouble breathing and pain around her heart. Her kidneys also were affected. Because of the severity of her condition and the evidence from scientific research that abnormal adrenal gland function plays a part in high blood pressure, and even in diabetes, the patient, her husband and the doctors decided to undertake the drastic operation.

When seen nine and 15 months after the operation her heart and blood pressure were normal, she could read without eyeglasses, the kidney disease had been arrested and the diabetes was markedly improved. She still had to take insulin, however.

Her skin had darkened because of the Addison's disease produced by removal of the two adrenal glands. This disease which used to be invariably fatal was kept under control by use of adrenal gland hormones.

The doctors reporting the case do not recommend removal of both adrenal glands as a treatment for either malignant high blood pressure or diabetes. But they point out that this operation in a limited number of otherwise hopeless cases might lead to better understanding of the two diseases and to their treatment by chemical blocking agents.

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CHEMISTRY

Garbage-Filled Gravel Pits Goal of English

► ABANDONED quarries and flooded gravel pits which pockmark the English countryside are being turned back into level usable farmland, filled with England's garbage.

This would be a simple process but for one major—and literal—headache, the foul-smelling, paint-blackening gas called hydrogen sulfide. When garbage decays, particularly in water, the living organisms which break it down release great quantities of hydrogen sulfide, much to the displeasure of any one living downwind.

The British Department of Scientific and Industrial Research has begun a series of experiments, however, using the clinker ash from incinerators, acid and types of bacteria to eliminate production of this gas from underwater garbage dumps.

One method is to divide a large sinkhole into smaller lagoons with dikes built of the inert clinker. Putrescent refuse is then dumped into each lagoon so quickly that it is filled before the gas nuisance can develop. If some gas is put off, acid is added to the water to prevent further growth of the decay bacteria.

Other types of bacteria are also being tested as possible ways to eat up the hydrogen sulfide as fast as it is produced. If they prove feasible, this new form of bacteriological warfare may help to solve England's serious shortage of garbage disposal space and give the British more land for housing or agriculture.

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PHYSICS

Measure Velocity of Water By Sound Waves

► THE velocity of water in the discharge from turbines in hydroelectric plants may be measured by passing sound waves in the ultrasonic region through the water, the American Institute of Electrical Engineers was told in Baltimore.

The method of using ultrasonics for this purpose was described by W. B. Hess and S. K. Waldorf of Safe Harbor, Pa., Water and Power Corporation, and R. C. Swengel of York, Pa. They presented the results of tests made with a small duct, five by nine inches in cross section, with water velocities up to six feet per second.

The ultrasonic method, they declared, appears to have distinct advantages over existing methods of measuring the discharge of turbines in large hydroelectric stations. In carrying the method to the present state of development a great many difficulties have been overcome. It now appears that remaining difficulties may be overcome and the method applied to large scale measurements.

This method of using sound waves too high-pitched to be recognized by the human ear consists essentially of calculating water velocity from the measured phase angle between the transmitted ultrasonic signal and the signal received after passing through the body of moving water, they stated.

Instruments to pick up the sound waves after they passed through the water were placed on the wall of the water duct opposite the transmitter and "displaced some definite distance along the principal axis of flow." From this the phase angle was determined. Errors of less than two percent were obtained in measurements in the test duct.

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IN SCIENCE

VETERINARY MEDICINE

Find Cocker Spaniel With "Blue Baby" Heart

► A COCKER spaniel with the rare condition called a "blue baby" heart is reported by doctors at the State College of Washington in Pullman, Wash.

The dog had difficulty in breathing. When it became excited, it would faint. Its skin had a bluish tinge. In human beings, these signs would indicate one of several defects of the heart which have come to be labeled "blue baby" conditions.

The veterinarians found that a duct between two chambers of the spaniel's heart, which should have closed soon after birth, had remained open. Blood which normally would have passed through the lungs before going to the body by-passed the lungs through this opening, and the body was robbed of vital oxygen in the bloodstream.

As in humans, such congenital heart conditions in animals are quite rare, the veterinarians said. Several cases in cattle were also reported, but from 2,000 post-mortem examinations at the Washington veterinary medical school, only six serious heart irregularities were discovered.

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ICHTHYOLOGY

Find 79 New Varieties Of Fish at Bikini Atoll

► SMITHSONIAN Institution scientists revealed that at least 79 new types of fish were discovered at Bikini Atoll before and after A-bomb tests in 1946.

Dr. Leonard P. Schultz said atomic radiation had nothing to do with the sudden appearance of so many new varieties, although some of the preserved fishes brought back from Bikini remained radioactive for as long as a year.

The tremendous scientific project known as Operation Crossroads made Bikini and its surrounding waters the most studied island in the Pacific, Dr. Schultz said. For scientists in all fields, the summer-long sojourn on the lonely atoll was a windfall.

The work of sorting and identifying the Smithsonian fish collection is still far from complete. A total of 481 different species have been distinguished so far.

Some of the fish are fantastic in appearance. One of the smallest fish in the world, a coral-dweller little more than half an inch long, was found. The Smithsonian also got a giant puffer, a cardinal fish with a belly stripe that lights in the dark, and flatheads which were ostriches in reverse—they lived completely covered by sand except for their mouths.

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SCIENCE FIELDS

MEDICINE

Standardization of Test Tube Dads Urged

► MORE care and standardization in selection of test tube fathers is urged by Dr. Murray Russell of Beverly Hills, Calif., in a report to the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Oct. 7) in Chicago, Ill.

The demand for artificial insemination is increasing, he points out. War injuries which have increased the ranks of relatively and absolutely infertile men constitute part of the reason for the increased requests physicians are getting for this procedure. Difficulties and objections to adoption also account for the increase.

"In the past it was not uncommon," Dr. Russell points out, "for a donor to be chosen at random from among university students or hospital interns. He was, and still may be, approached at the last moment for the donation without examination, blood studies or determination of his fertility."

"Many so chosen were never fathers. This haphazard choosing oftentimes ended in failure of insemination with loss of valuable time, money and effort. It was fraught, also, with risk to the potential mother of transmission of venereal or hereditary diseases and incompatibilities of blood types."

Items which Dr. Russell says should be checked in selecting donors are: complexion, height, weight, color of eyes and hair, schooling, intellectual background, religion, family background, presence or absence of such diseases as asthma, diabetes and allergies, frequency of twins and triplets in the donor's family, complete medical and venereal history, number of children sired and their state of health, occurrence of premature births, stillbirths and miscarriages of the donor's natural wife, urinalysis, serologic tests, Rh blood typing and semen analysis.

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ENGINEERING

Brains Aid Cancer Detection Test Search

► ELECTRONIC calculating machines are helping in the search for early cancer detection tests, Dr. Gilbert W. King of Arthur D. Little, Inc., Cambridge, Mass., chemical engineering firm, reported in Endicott, N. Y.

The punch card machines are used to compare spectrum patterns of abnormal chemicals in urine which might give clues to the presence of cancer. Physicians at Massachusetts General Hospital in Boston have accumulated such patterns for nearly 500 substances that may be significant in

spotting early cancer. But comparing and matching patterns by ordinary methods may take as long as a week. The punch card method completes the job in a few minutes, which is more than 350 times faster than conventional methods.

Dr. King gave details of the punch card method at a special seminar on industrial computation sponsored by the International Business Machines Corporation.

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SAFETY

One Hundred Million in Critical A-Bomb Areas

► ONE hundred million Americans live within "critical target areas" which are likely to be attacked by A-bombs should an all out war come, the National Security Resources Board in Washington, D. C., warns.

The NSRB's Office of Civil Defense sent to all state governors copies of maps indicating the critical target areas within their cities and suggesting that they immediately begin planning the civil defense of those areas.

Plans, a booklet accompanying the maps said, should be based on areas of mutual aid and mobile support. The other 50,000,000 Americans, according to the booklet, are expected to supply aid and support to critical target areas in their vicinity.

Three kinds of critical targets are indicated: Type I, industrial-metropolitan areas; Type II, industrial areas; and Type III, metropolitan areas. Some critical target areas are so secret that they are not indicated on the maps, although the booklet assumes the governors concerned will know about them and plan accordingly.

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MEDICINE

Obesity Considered As Disease

► OBESITY, or overweight, "should be regarded as a disease," states the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Oct. 7).

"Of immediate importance in the control of arteriosclerosis (hardening of the arteries) is the need for curbing obesity," the editorial states.

Research implicating the fatty substance, cholesterol, in the cause of artery hardening needs to be continued. But, the editorial warns, "it seems unwise" to ban from the diet foods containing cholesterol if there is risk of sacrificing nourishing qualities unless there is clearcut evidence for the beneficial effect on the artery condition.

Physicians are warned against misleading advertising claims proposing other substances as substitutes for the cholesterol-containing foods.

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ENGINEERING

Tarred Roads No Longer Hazard in Rainy Weather

► BRITISH scientists, by a new treatment for crushed stone, have ended the ruin a heavy rainfall can cause to a freshly-tarred road.

Many asphalt roads are maintained by spraying a film of tar on the road surface and covering the film with crushed stone. If it rains too soon, the wet stone will not stick to the tar. Traffic scatters the stone, and the dressing has to be done all over again.

A coating of creosote, mixed with a chemical wetting agent and applied to the stone, has been found to keep out the water. The result, tested on roads in many parts of England, is that the stone sticks to the road no matter how hard or how soon it rains after the dressing has been applied.

The new treatment, though it adds an initial expense, will save thousands of dollars by eliminating waste in highway maintenance.

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ENGINEERING

Robot-Controlled Tools "Plan" Like Human Beings

► ROBOT-controlled machine tools, automatic pilots for airplanes and the giant new mechanical computers have reached a point where they now "plan" and "act" along lines of human reasoning.

The vacuum tubes in a modern electronic amplifier affect each other much as do people who work together, Herbert K. Weiss, an Army ballistics research scientist, said in New York in a lecture sponsored by the American Institute of Electrical Engineers.

The basic principle of the new machines is "feedback control," Mr. Weiss said. Such systems give a machine a built-in plan of action. They compare the machine's progress with the desired objective, and if there is any discrepancy, adjust the machine automatically to correct the situation.

But these near-human powers are not enough. The design of feedback systems has advanced so much that machines actually have critical judgment, the Army scientist stated.

Such an electronics system, he said, may have to examine its sources of information with a sharp eye, separating true information from false and acting only on data which it, the machine, concludes is reliable.

Mr. Weiss, who works at the Army Ordnance ballistics research laboratory at the Aberdeen, Md., Proving Ground, said such powers are really very simple. They have been developed, he said, through use of basic principles in mechanical, electrical and communication engineering, probability theory and "operational mathematics."

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MEDICINE

New Hope for the Burned

Relief for burns has top medical research priority. For the first aider the rule is to relieve pain, prevent infection and treat shock.

By JANE STAFFORD

Third in a series of atomic bomb first aid.

► BURNS and how to cure them are today's hottest medical problem, thanks to the danger of A-bomb radiation added to the more peaceful accidents such as smoking in bed.

The best cure for burns is to prevent them. But if you are burned badly, the chances are you will get the best treatment the world has ever been able to give to burns.

Ugly, dangerous burns with the flesh literally cooked and charred and the skin totally destroyed are called third degree burns. The sign of a second degree burn is the blister, though you cannot always tell by this sign immediately, because the blisters may not form until hours or even a day later.

First Degree Burns

The first degree burn, unlike murder, is the least serious. The reddened skin of a mild wind or sunburn is an example of a first degree burn. The damage is confined to the most superficial layers of the skin which may "peel" in small powdery flakes. If you blistered after that day at the beach, however, you had a second degree burn. How sick you were depended on how much of your skin got that seriously burned.

The amount of body surface burned as well as the degree of the burn plays a part in the severity of the burn. Up to the time of the second World War, first degree burns involving two-thirds of the body surface and, in adults, second-degree burns involving one-third of the body surface were generally fatal. But in 1945 a Navy surgeon could report the recovery and return to duty within three months of a young Marine who had second and third degree burns over 83% of his body.

To get such results requires practically the whole armory of medical weapons from gauze to steaks and the surgeon's skin grafting instruments. And it requires also a corps of trained medical personnel.

Discovery of the sulfa drugs and then of penicillin and other antibiotics has greatly aided the victims of severe burns. Infection has long been a major problem in burns, particularly those occurring in disasters in which the victims may have other wounds besides the burn. In the event of an atomic disaster, the infection prob-

lem is greater because radiation from the bomb reduces resistance to infection.

Medical scientists have not yet agreed on the best method of fighting infection in burns. Some believe that sulfa drugs or penicillin should be put directly onto the burn, usually in the form of an ointment, when the first dressing is put on.

Others think it better to put nothing on the burn itself except a sterile dressing or a sterile dressing impregnated with petrolatum. This group thinks the penicillin or other anti-infection drug should be given by hypodermic injection, as in the case of pneumonia or other infection, to be carried to the burned area and all other parts of the body by the blood stream. But, says the other side, this method of giving penicillin requires more trained personnel to give the hypodermic injections.

Both sides agree that when there are other wounds besides burns, as there are likely to be in case of an atomic or other great disaster, "shots" of penicillin would have to be given.

The solution may come, at least for atomic bomb burn victims, through aureomycin or some other antibiotic which is effective when given by mouth in pills or capsules.

Exposure Treatment

One of the methods of treating burns now under trial in a couple of burn research centers is the "exposure method." With this method nothing is put on the burn. It is left completely exposed to the air, but the burned part is immobilized in some way. Good healing of superficial burns, without infection in one to four weeks, has been reported with this method. Penicillin "shots" are given the patient as part of the treatment. How well this method works with deep burns that extend through all layers of skin and sub-skin tissue remains to be seen.

Direct opposite of the exposure method is the pressure dressing which came into use during World War II and has continued in use since then. These are large pads of absorbent, resilient material bandaged on tightly and left in place for a week or 10 days. With this dressing pain is greatly relieved and almost all superficial burns, mild or deep, heal in one to four weeks if infection does not develop.

Nylon is also on trial as a burn dressing. English doctors have been trying nylon bags to cover burned hands and pieces of nylon to cover other burned areas.

Flash burns, such as come in atomic attacks, and also in explosions, are superficial but extremely painful. Small doses of morphine or codeine do a good job of relieving pain in superficial burns, and even in deep burns, especially when the burn is covered. The covering of the burn alone does much to relieve pain and this is one reason medical scientists have been working hard to find good simple ways of covering burns without contaminating them for use in large scale disasters.

Morphine's Second Role

Morphine, however, may turn out to have another important value in treatment of burns besides that of relieving pain. It may reduce the swellings from accumulations of fluid, known medically as edema, which come with severe burns. In studies with guinea pigs, scientists have found significant decreases in the swellings with increasing doses of morphine given before the burn. The studies are still going on and it is not known yet whether the preliminary results will prove out, especially when applied to burned humans instead of burned guinea pigs.

Severely burned patients suffer shock, anemia and, if they survive the first shock period, a kind of poisoning from the absorption of poison products from the burned tissues or from infection or both. Plasma, the fluid part of the blood, as well as red blood cells are lost from the circulation



BURN DESIGN—Survivor of an atomic bomb blast, this Japanese woman was burned in a pattern corresponding to the dark portions of a kimono she wore. Where the garment was tight across the skin, the heat flash burned through, charring the flesh.

into the burned tissues.

Plasma and blood albumin help fight the shock. But severely burned patients need whole blood as well. As one doctor puts it, burned patients "seem to burn up transfused blood."

An A-bomb victim needs even more blood because the radiation from the bomb damages the blood-forming organs in his body. This makes him worse prey, also, to germs not only in the burn or other wounds but to those in the air.

Because the burn patient loses the fluid part of the blood, this also must be replaced, as must salt and other minerals and vitamins. So plasma, albumin, whole blood and salt solutions are given by vein and as soon as he can drink and swallow, fluids of all kinds are "forced."

Proteins for Patients

Steaks and their equivalent in good protein are a "must" in the diet of the burn patient. A protein ration of at least 125 grams per day is advised. That is four ounces or more, and the four ounces means protein, not just meat. It would take at least a pound of sirloin steak, weighed without the bone, to furnish the four ounces of protein.

Because of the vast amounts of blood that would be needed to save victims of an atomic attack, scientists are vigorously pushing research on blood substitutes. More correctly, these should be called plasma substitutes, because so far no one knows of any real substitute for whole blood. Of the plasma substitutes, useful for fighting shock and therefore important, dextran seems at present to hold most promise. This is a Swedish product developed during World War II, a by-product of sugar manufacture.

Being pushed also, under the American Red Cross national blood program, is research into ways of keeping whole blood or red blood cells longer. At present, three weeks is the limit of the useful life of red blood cells and therefore of whole blood that has been drawn from the body. Any material extension of this time limit would make possible stockpiling of blood on a larger scale for use in case of large scale catastrophes.

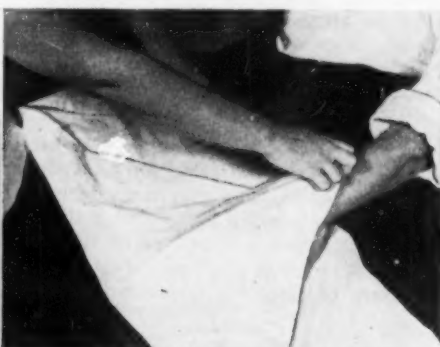
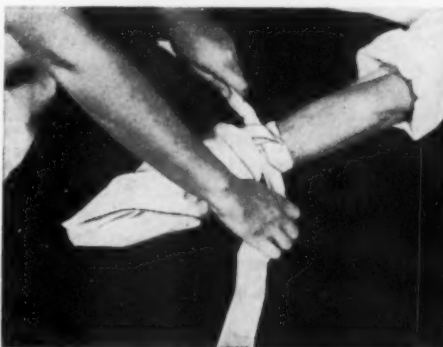
Burns are expected to make up anywhere from one-fifth to one-half the casualties in such an attack.

Estimates based on the Japanese experience may be too high. With any warning of the attack, large numbers of people should be able to find shelter from the heat flash accompanying the bomb burst. If fire-fighting plans now being made are carried out, it should be possible to reduce the number of burn casualties still further, because many of these were caused by uncontrolled fires after the atom bombings in Japan.

Several thousand severe burn casualties, however, can be expected in any community that is atom bombed. It is to care for these as well as for the victims with serious



HEAD BANDAGE—A shirt, old sheet or handkerchief makes an open face bandage to keep the air from a facial burn or scald.



HAND BANDAGE—Place a dressing over the wounded area; then secure as shown above.



LEG BANDAGE—Start diagonally, take the longer lower end firmly around the ankle once, then spiral up the leg and tie the ends.

bleeding, broken bones and torn and mangled flesh, that 20,000,000 lay persons must be trained in first aid.

Some of you, through your local civil defense organizations, may be called to take special training for work on a burn team. But everyone can learn the simple, immediate first aid treatment for burns, whether caused by atom bombs or an upset pot of boiling liquid on the kitchen stove.

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MEDICINE

The How of First Aid to Burns

The first thing to remember about a burn, no matter how severe or slight, or what the cause, is to keep it from getting infected. In other words, keep germs out, just as you are careful to keep germs out of an open cut or other wound.

You might think that a burn would be sterile, all the germs killed by the heat that seared the flesh. Hospital experience, however, shows that this is not the case.

If you can get the patient to a doctor, hospital or burn station quickly, you do not need to put anything on the burn. Watch to see that clothing does not brush against it, that no one coughs, sneezes or, in the case of children, weeps into or onto the burn.

In case of an atom bomb attack, and often in other cases of burn injuries, it may not be possible to get the victim to medical aid very quickly. In such a case, put a sterile dressing on the burn to cover it and protect it both from the air and from germs.

The sterile dressing will help ease the pain. Any covering over a burn helps to stop the pain—but do not use just any covering. At Hiroshima people put rice flour, raw ground potato and cucumber juice on burns. This, says Dr. Everett Idris Evans, burn authority at Richmond, Va., "undoubtedly accounted for the widespread subsequent infection," even though these substances apparently did relieve pain.

If you have no sterile dressings at hand, use the very cleanest cloth you have. Ironing the cloth or heating it in an oven will make it more nearly sterile and germ-free. Be careful when you put the dressing on and bandage it in place to avoid touching the burn or coughing or sneezing near it.

MEDICINE

Mumps Vaccine Available

► A VACCINE against mumps will soon be available commercially. Two pharmaceutical manufacturing companies, Eli Lilly and Company of Indianapolis and Lederle Laboratories, Pearl River, N. Y., have been licensed by the National Institutes of Health in Washington to produce mumps vaccines. The Lederle product is now on the market.

Credit for making the first mumps vaccine in history has been given to Dr. Karl Habel of the U. S. National Institutes of Health. He first attacked the mumps problem in 1940, when Army, Navy and Public Health authorities were expecting large scale mumps outbreaks in military training camps such as occurred during World War I. Dr. Habel succeeded in getting the mumps virus to grow on chick embryos. Following this he prepared a vaccine on a laboratory scale. Unpublished results of success in trials with this vaccine in 1946 have led to development of the vaccines by the manufacturing houses.

At Lederle Laboratories, Dr. Victor Cabasso worked out development of the Lederle product under the direction of Dr. Herald R. Cox.

The vaccine is expected to be used chiefly in schools, camps and other institutions when outbreaks of mumps threaten. It probably will not be advised at present for

Nurses and doctors in hospitals wear face masks, you know, when dressing a burn to keep germs from their breath getting into the burn.

If the first sterile dressing does not relieve the pain, put another one on top of the first, without disturbing the first one. The second one very likely will stop the pain.

You can reassure a burn victim who complains of the pain by telling him that the painful burns are not the serious ones. This is because in serious burns, the nerve endings are destroyed and the patient does not feel any pain. Do not, however, tell this to the burn victim if he does not complain of pain.

Many people have a tube or jar of medicated burn ointment in the home medicine chest or first aid kit. Tannic acid was once widely used by doctors to treat burns and ointments containing it were widely sold. Later, doctors found that tannic acid was not good medicine for burns and now they do not advise it. Some burn ointments have medicines in them to relieve the pain. Most authorities now, however, advise that if you do use an ointment, you use a bland petrolatum ointment or jelly, such as Vaseline petroleum jelly.

Shock, the third thing the first aider must be prepared to handle in burn cases, is a subject for a lesson in itself, particularly since shock is something to consider in any major injury.

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BIOLOGY

Virus Breeding May Be Weapon Against Disease

► RESULTS of virus breeding, which might become a new weapon in the fight against diseases such as influenza and poliomyelitis, were reported by Dr. Frank M. Burnet, director of the Walter and Eliza Hall Institute, Melbourne, Australia, at the New York Academy of Sciences in New York.

"Of high practical importance," said Dr. Burnet was the discovery that the peculiar characteristics of one strain or type of influenza virus might under certain controlled conditions be acquired by another type of flu virus.

In his laboratory he was able to transfer the characteristic of turning to nerve tissue, which is a characteristic of the polio virus, to another type which so far has developed no tendency to turn toward nerve tissue.

Although at present virus breeding is a research matter, a possible future application might be development of vaccines for preventing diseases such as influenza.

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PHYSICS

Radiation Indicator Made 50 Times More Effective

► THE radiation indicator developed at the University of California at Los Angeles has been made "at least 50 times more effective" than the first model, it was reported.

To get this great increase, the alcohol preservative in the chloroform used in the indicator was removed, Dr. George V. Taplin of the University's staff announced. Dr. Taplin, who works on the University's Atomic Energy Project, first revealed the new radiation indicator last February.

The indicator is small, efficient and cheap, and can be made up in the shape of a cigarette lighter or a fountain pen. It contains chloroform and a purple dye. When struck by X-rays or gamma rays, the purple dye turns yellow.

"By removing the alcohol preservative in the chloroform, the production of hydrochloric acid is increased," said Dr. Taplin, "thus making it at least 50 times more effective than previous models."

The new device is called a "dosimeter" because it measures the "doses" of radiation that a person might receive when working near radioactive material or when he entered an atom-blasted area.

Dr. Taplin believes it will be valuable in three ways:

- (1) As a general personnel monitoring badge.
- (2) As an emergency personnel monitoring device for those engaged in rescue work.
- (3) As a strategically-placed area monitoring device.

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PSYCHIATRY

Incurable Patient Recovers

► THE "swift and dramatic" recovery of a 72-year-old woman who had been kept in a locked ward of Topeka State Hospital in Topeka, Kans., for 17 years as incurably insane was reported by Dr. James M. Mott, Jr., staff psychiatrist at the hospital.

The recovery was not the result of any specific treatment, such as electroshock or medicines. Instead it seems to have resulted from a change in the regimen at the hospital and a new staff of doctors who looked on all the patients as potentially curable.

The patient had been sent to the hospital at the age of 55 after she had tried to kill her husband. A year before that she had shown delusions and other signs of serious mental illness. All the years she was in the hospital she continued to have delusions that people were plotting against her and trying to prevent her being paroled to leave the hospital. She worked willingly and expertly in the sewing room and was very likeable, but made a nuisance of herself to patients and attendants because of shouted harangues about the gangs she thought were plotting against her.

The fact that Dr. Mott looked on her as a patient who might recover, even though she had been considered incurable for 17 years, and treated her in that way in every interview apparently was what brought about her recovery. Previously a doctor had told her, she related, that "she might as well make up her mind she was going to be in the hospital the rest of her life, and to settle down and make as happy an adjustment as she could." She was so isolated from the world that she did not even know about red and green stop lights on city streets.

Dr. Mott soon after his first contact with her took seriously her desire to leave the hospital. He began discussing some reality factors involved in her discharge, such as where she would live, arrangements for weekly visits to the hospital, and the like. He also pointed out, and she readily agreed, that most people thought much of what she said and did was "crazy" because they did not understand her. He persuaded her gradually not to talk about the "plotting criminals" except to him.

She gradually stopped having hallucinations, began going down town, at first with a companion, and after about six months of Dr. Mott's treatment began applying for jobs. Within eight months she was able to take a job as housekeeper for an elderly woman with heart trouble. After that woman died, the doctor who had cared for her and her relatives gave Dr. Mott's patient excellent recommendations which helped her to find another job where she is now working satisfactorily.

Although she has only been out of the hospital six months, and therefore

cannot be considered "cured," her recovery suggests, Dr. Mott thinks, that a similar attitude of expecting recovery should be taken toward the thousands of other patients in mental hospitals who are now labelled incurably insane.

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ENTOMOLOGY

Cannibal Mosquito Preys On "Carrier" Cousin

► HAWAIIAN scientists are experimenting with a "cannibal mosquito" from Africa which feeds on its blood-sucking and disease-carrying cousins, trying to work out a program to control mosquito-borne diseases.

The beneficial insects, known technically as *Megarhinus brevipalpus*, are being cultivated and tested in a special breeding colony. They were imported by the Territorial Board of Health from the South African Institute for Medical Research.

The cannibal mosquito does not attack man or animals, entomologists say. But when it breeds in the same waters as more dangerous mosquitos, the larvae eat the young, blood-sucking variety.

One variety of cannibal mosquito was im-

ported into Hawaii in 1929 from the island of New Britain. These all died, however, before any practical tests could be undertaken. The African variety is believed to be sturdier.

Dr. C. E. Pemberton, entomologist of the Hawaiian Sugar Planters' Association experiment station, said the new variety has certain characteristics, different from the New Britain species, which may enable it to thrive under Hawaiian conditions.

If the experiment is successful, scientists in Honolulu are hopeful that the mosquito ally will help control such mosquito-borne diseases as yellow fever and dengue fever.

Science News Letter, October 14, 1950

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ZOOLOGY

NATURE RAMBLINGS



Woodchuck

► THIS is the time of year when you finally expect to learn how much wood a woodchuck really chucks, assuming the pesky animal could chuck wood after spending all summer digging tunnels through your garden.

The answer is, "Not any." As a timber handler, the woodchuck is a decided flop. He bothers himself not at all in laying in a winter's supply of fire wood, for he has a much better way to keep warm. By dint of all the vegetables he has pilfered, he is a veritable butter-ball by the time frost begins to sting his ears. His layers of fat will insulate him from the cold and supply enough energy to stay alive until another spring brings a new crop of good things to eat.

It is amazing the fine, resounding reputation the woodchuck has built up for himself. Not only is he considered a lumberjack of the Paul Bunyan school, but under an alias, the groundhog, he is presumed to be an infallible weather prognosticator. Each year on Feb. 2 his opinion on the amount of winter remaining is eagerly sought. Yet there is no authentic case on record of his ever having paid attention to his shadow, even when it was in plain sight. "Groundhog" forecasts might just as well be made by flipping a coin.

The woodchuck, or groundhog, or marmot—call him what you please—is one of the medium-sized rodents, kin to the rabbit and the rat. He has, however, neither the long ears of the rabbit nor the long tail of the rat. He resembles instead his other cousin the guinea-pig.

It is surprising how many rodents are given false positions in the pig pen by colloquial nomenclature—groundhog, guinea-pig, and porcupine for examples. The woodchuck seems to have been given a double pig-christening for "chuck" is an English country dialect word meaning a small pig or shoat.

Although there is no connection in zoology's family tree, the woodchuck does vie with his ham-and-bacon namesakes as an eater and sleeper. He breakfasts heavily, lunches moderately and dines inordinately

on the most appetizing green stuff that he can find. After sleeping from dusk to dawn, he takes a long nap in the morning and a shorter one in the afternoon.

Then, as winter approaches, he retires with a yawn and settles down to a real sleep. Like most of his rodent relatives, the woodchuck is a burrower, though not at all a particular one. Once he has dug a home he sleeps in it, rather than expending any effort in improving it. Why worry about wallpaper in a bedroom, when all one is planning to do is sleep in it.

Science News Letter, October 14, 1950

NUCLEAR PHYSICS

Michigan Atomic Energy Project Self-Financed

► THE UNIVERSITY of Michigan's atomic energy project just inaugurated is unique because it has not sought government money, although it has enthusiastic best wishes from the Atomic Energy Commission.

Called the Phoenix Project, this name for the privately financed research into the atom's physics, chemistry, medicine and human problems as well, came rather spontaneously from the Michigan student body when they heard of the plans.

The phoenix of Egyptian mythology was a sacred bird which burned itself upon the altar and rose again from its ashes young and beautiful. In the searing of our civilization through the threat of atomic energy used for destruction, the Michigan Phoenix project may raise something peaceful and useful from the threatened damage.

To the thousands of scientists working for the government directly or indirectly on secret and non-secret research, the Phoenix project will add a small body of experts who attack atomic problems from without the necessary framework of the government organization.

Chairman Gordon Dean of the AEC emphasized in a speech at Ann Arbor the attention that will be paid to social, economic and ethical problems by the Phoenix project.

Science News Letter, October 14, 1950

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ACCIDENT FACTS, 1950 EDITION—*National Safety Council*, 96 p., illus., paper, 60 cents. Includes information on occupational, transportation, home, farm and school accidents.

COMMUNITY LEADERSHIP—*American Association of School Administrators*, 24 p., illus., paper, 25 cents. Written to aid administrators in translating some of the basic concepts of cooperative leadership into community action for school improvement.

CORE CURRICULUM IN PUBLIC HIGH SCHOOLS: An Inquiry Into Practices, 1949—Grace S. Wright—Gov't. Printing Office, Federal Security Agency Bull. 1950 No. 5, 32 p., illus., paper, 15 cents. This bulletin is the outgrowth of a more extensive survey of curricular offerings of public high schools.

EXECUTIVE PLANNING—IF AN A-BOMB FALLS—R. Maxil Ballinger—*National Industrial Conference Board*, 19 p., illus., paper, \$1.00. A report giving information about atomic bomb effects and about protective measures industrial plants might use to reduce their hazards.

THE FILM BOOK: For Business, Education, and Industry—William H. Wilson and Kenneth B. Hass—*Prentice-Hall*, 259 p., illus., \$4.65. Presents information on many aspects of the film industry.

GLOSSARY OF BOTANICAL TERMS COMMONLY USED IN RANGE RESEARCH—W. A. Dayton—Gov't. Printing Office, U. S. Dept. of Ag. Misc. Publ. No. 110, 40 p., illus., paper, 20 cents.

GROUP LIFE: The Nature and Treatment of Its Specific Conflicts—Marshall C. Greco—*Philosophical Library*, 357 p., \$4.75. An attempt to explain neurotic and allied difficulties as well as their treatment from the point of view of an historical, group-life approach.

MATHEMATICAL SNAPSOTS—H. Steinhaus—*Oxford University Press*, 266 p., illus., \$4.50. Many mathematical operations are made graphic and explained.

A NATURAL HISTORY OF TREES OF EASTERN AND CENTRAL NORTH AMERICA—Donald Culross Peattie—*Houghton Mifflin*, 606 p., illus., \$5.00. A handbook of trees giving their popular and technical names and general data in non-technical terminology. Many detailed sketches are presented.

THE PHASIAN BIRD—Henry Williamson—*Little, Brown*, 276 p., illus., \$4.00. The story of a hybrid pheasant's fight for survival during the years 1937-1944.

PRINCIPLES OF PSYCHOLOGY: A Systematic Text in the Science of Behavior—Fred S. Keller and William N. Schoenfeld—*Appleton-Century-Crofts*, 431 p., illus., \$4.00. An introductory college text.

SCIENCE AND THE PURPOSE OF LIFE—Boris Sokoloff—*Creative Age Press*, 284 p., \$3.00. The author discusses the problem of integrating religious theories with scientific theories.

SYMPOSIUM ON APPLICATION OF STATISTICS—*American Society For Testing Materials*, 36 p., illus., paper, \$1.00. These papers and discussions were presented at the First Pacific

Area National Meeting of the American Society for Testing Materials, San Francisco, Calif., Oct. 10-14, 1949.

TABLE OF THE BESSEL FUNCTIONS $Y_0(z)$ AND $Y_1(z)$ FOR COMPLEX ARGUMENTS—Computation Laboratory National Bureau of Standards—*Columbia University Press*, 427 p., \$7.50. One of a series of such tables which has been prepared by the Computation Laboratory.

ULTRASONIC COAGULATION OF PHOSPHATE TAILING—Dudley Thompson—*Virginia Polytechnic Institute*, 77 p., illus., paper, 75 cents. The results of an investigation made by the author.

WAVE MECHANICS, Vol. I: Elementary Theory—J. Frenkel—*Dover*, 2nd ed., 312 p., illus., \$3.50 (Vol. 1 & 2: \$7.50). A general survey of the subject of wave mechanics using elementary mathematics.

WAVE MECHANICS, Vol. II: Advanced General Theory—J. Frenkel—*Dover*, 524 p., illus., \$5.00 (Vol. 1 & 2: \$7.50). Presents mathematical ideas which form the physical principles of wave mechanics.

Science News Letter, October 14, 1950

GENERAL SCIENCE

Russian Scientists Get Credit for This Discovery

► HERE is a discovery for which Russian scientists deserve credit. They found eight years ago that two gases that mix readily under normal conditions separate into layers under extremely high pressure. Their observations have recently been confirmed at Yale University.

Two Yale chemical engineers, Prof. Barnett F. Dodge and A. E. Lindroos, are responsible. They found that two gases, which mix intimately under normal conditions, separate into two phases or layers when the mixture is put under a pressure of 50,000 pounds per square inch.

Going further than the Russians, they found another peculiarity which they call a "barotropic phenomenon." The lighter gas, which at first separated and floated on

top of the heavier gas, became heavier and sank to the bottom when pressures were increased.

Science News Letter, October 14, 1950

AERONAUTICS

New Device Feathers Propellers Automatically

► FEWER crashes of airplanes at take-off are promised with a new electric device for feathering the propellers automatically in case of an engine failure. The device was described in Baltimore, Md., to the American Institute of Electrical Engineers by Wilfred L. Kershaw of the Glenn L. Martin Company.

Feathering a propeller means turning its blades in their sockets so that they cut the air without causing the propeller to revolve. It is common practice with multi-engine craft in case an engine fails. The object is to keep the propeller from "windmilling" or rotating in the wrong direction to create extra air resistance.

The special feature of this device is that it works automatically in two seconds after engine failure. Manual operation by the pilot may be too late to prevent a crash.

The time-lag between the lack of propeller thrust from the faulty engine and the consequent windmilling of the propeller is a matter of seconds, Mr. Kershaw stated, and before the pilot can manually feather the useless propeller, the airplane may be out of control.

The device is complicated from the layman's standpoint. A time delay is to prevent initiating the feathering for cases in which the power loss is of a momentary nature. A special relay causes the delay.

Science News Letter, October 14, 1950

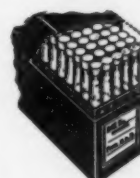


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Science News Letter, October 14, 1950

❁ **SUITCASE CARRIER**, a two-wheel collapsible affair with harness to hold a luggage bag, weighs about one pound and can be quickly attached when needed. Adjustable to bags up to 10 inches in width, the harness and angle-shaped end holders grasp the bag at opposite corners.

Science News Letter, October 14, 1950

❁ **UKULELE PLAYER**, a plastic device which fits over the neck of any standard instrument, eliminates complicated fingering and makes learning to play easy. The player device is a bridge over the neck in which are six buttons, each of which when pressed plays a complete chord.

Science News Letter, October 14, 1950

❁ **RAIN BAG** for a baby, shown in the picture, is zipper-closed but has a hood with drawstring closure. Made of waterproof plastic in blue or baby pink colors, the bag is ample in size to hold an infant wrapped



in a blanket. The durable plastic used can be cleaned with a damp cloth.

Science News Letter, October 14, 1950

❁ **ACCESSORY PACKAGE** for night fishermen contains a gasoline lantern bracket to fit all oar locks, a reflector, a lantern

lighter and two live-bait fishing lures. The bracket permits the lantern to be swiveled 360 degrees as needed. The reflector is aluminum with a high-reflective finish.

Science News Letter, October 14, 1950

❁ **SERVING FORK** for the dining table has a tiny pusher plate between the tines to remove food from them. The plate in this newly patented invention is on the end of a rod that extends through the center of the fork's handle and is manipulated by a finger.

Science News Letter, October 14, 1950

❁ **MOP-AND-WRINGER** combination is designed to ease the job of floor cleaning. On the handle of a mop much like the ordinary household kind is a casing containing rollers for wringing. The wet mop is moved through the rollers by pulling its handle. It is a device recently patented.

Science News Letter, October 14, 1950

❁ **COIN-HOLDING BRACELET**, a recently patented invention, consists of a series of holders, each designed to hold one coin. Coins are engaged beneath a lip and held in place by a spring. The bracelet is ornamental, inexpensive to make, durable and practical.

Science News Letter, October 14, 1950

Do You Know?

Liquefied petroleum gases are now used in cigarette lighters.

In the past 20 years coffee consumption in the United States has almost doubled.

In a single year, there are never more than five eclipses of the sun, both partial and total.

Corncob pellets, made by grinding the cobs, are successfully used as filler in making a light-weight concrete.

Oysters are good to eat any time of the year but they are fatter and more palatable during the so-called "R" months.

Only 14 states in the nation permit vehicles wider than eight feet on streets and highways except under special short-time permits.

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